Inflammatory Lesions in the Small Bowel

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Abstract

Crohn's disease and nonsteroidal anti-inflammatory drugs intake are frequent causes of inflammatory small bowel lesions. Unusual findings include ulcerative jejunoileitis, infections, radiation enteritis, and others. Endoscopic findings comprise ulcers, villous atrophy, lymphangiectasia, and erythema. This article is part of an expert video encyclopedia.

Keywords

CMV; Capsule endoscopy; Enterscopy; HIV; Idiopathic chronic nongranulomatous jejunoileitis; Mycobacteriosis; NSAID enteropathy; Radiation enteritis; Ulcerative jejunoileitis; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70103-1

Techniques

Small bowel capsule endoscopy and push enteroscopy.

Materials

- Endoscopes
  - Video capsule endoscopes:
    - Given M2A, PillCam SB1, PillCam SB2 (Given Imaging, Yoqneam, Israel).
    - Olympus Endocapsule 1 (Olympus, Tokyo, Japan).
  - Enteroscopes:
    - Olympus PCF Q 180 pediatric colonoscope (Olympus, Tokyo, Japan).
    - SIF-Q 180 Single-balloon enteroscope (Olympus, Tokyo, Japan).

Background and Endoscopic Findings

A few mucosal breaks (erosions and small ulcers) are frequently found in the small bowel of healthy volunteers.[1] Detailed history for nonsteroidal anti-inflammatory drugs (NSAID) intake is essential for differential diagnosis, as these drugs have a high potential to cause small bowel damage.[2] However, it has been shown that NSAID intake often is not disclosed by patients.[3]

More than three ulcers are suspicious for inflammatory bowel disease (IBD), predominately Crohn's disease.[4] However, diagnosis of IBD should not be based on endoscopic images alone.[5] History, histology, imaging techniques, and laboratory findings are helpful for a correct differential diagnosis, as many other conditions affecting the small bowel mucosa finally present as ulcerations.[6] These conditions include infections, vasculitis, ischemia, eosinophilia, celiac disease, neoplastic lesions, and diverticulitis. Iatrogenic lesions as side effects of therapy, as in NSAID medication, radiation, small bowel transplantation,[7] and acute graft-versus-host disease[8,9] following stem cell transplantation, should be considered as well.

Ulcerative jejunoileitis is a potential complication of celiac disease,[10–12] showing villous atrophy and ulcerations that may extend for long segments, especially in the proximal small bowel. Chronic idiopathic nongranulomatous ulcerative jejunoileitis is even less frequent, but may present with a similar endoscopic picture.[13]

Infection with cytomegalovirus (CMV) occurs more frequently in immunosuppression but may also be found in immunocompetent patients.[14] CMV ulcers appear punched out without an inflammatory reaction. In biopsy samples, 'owls-eye' cells can be found. Intestinal hemorrhage[15] or perforation[16] have been reported.

Intestinal tuberculosis may mimic Crohn's disease with ulcers in the distal small bowel. Differentiation is especially difficult in areas with a higher incidence of tuberculosis.[17]

Other rare infections like Whipple's disease[18] and atypical mycobacteriosis[19] of the small bowel present with edema and lymphangiectasia. Moderate diffuse lymphangiectasia may also be seen in human immunodeficiency virus (HIV) enteropathy, which requires small bowel biopsies to exclude other differential diagnoses.[20]

Radiation enteritis can develop even after years. Fibrosis, petechiae, lymphangiectasia, and neovascularization are typical findings. Fibrotic strictures pose a significant risk for retention in capsule endoscopy.[21]

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Tips and Tricks

To avoid capsule retention, a prior test with a self-dissolving patency capsule should be considered if complaints, patient's history, or imaging are suggestive of stenosis.

Atypical presentation of small bowel ulcers, especially if segmental or associated with a short history, should alert for diseases other than Crohn's, including ischemia, infection, vasculitis, and neoplasia.

Diffuse lymphangiectasia, especially if accompanied by marked edema and pronounced swelling and distortion of villi, warrants biopsy to exclude infection.

Undisclosed NSAID use is common, and should be reconsidered if endoscopic findings are compatible with NSAID enteropathy.

Abdominal radiation can cause enteropathy after many years. Hence, patients might forget to report previous radiotherapy spontaneously.

Complications and Risk Factors

Capsule endoscopy, push enteroscopy, and balloon enteroscopy are safe techniques. Complication rate is approximately 1%. In patients with established diagnosis of Crohn's disease, the risk for retention of a video capsule is higher.[22] The risk of perforation during enteroscopy might be higher in patients with Crohn's disease and postoperative anatomy.[23] Chronic intestinal ischemia, web formation due to NSAID enteropathy, and history of radiation may be associated with relevant stenosis.[24]

Alternatives

Transabdominal ultrasound is a cheap, easy, and repeatable diagnostic method for small bowel diseases causing thickened walls. Small bowel series and enteroclysis have widely been replaced by imaging techniques such as magnetic resonance imaging and computed tomography scan. Many inflammatory diseases of the small bowel can be diagnosed endoscopically by duodenoscopy or ileoscopy during upper- and lower-gastrointestinal endoscopy. Extending upper gastrointestinal endoscopy to the proximal jejunum by applying a pediatric colonoscope instead of a dedicated push enteroscope may further increase diagnostic yield. If these techniques are non-diagnostic, capsule endoscopy is the method of choice, with a high negative predictive value for inflammatory small bowel diseases. Capsule endoscopic findings may direct the access route of balloon enteroscopy for biopsy.[25] In case results of imaging techniques suggest a need for biopsy or therapy, e.g., balloon dilation of stenosis, balloon enteroscopy may follow directly.

Key Learning Points

- Many ulcers in the small bowel are due to Crohn's disease. However, multiple other conditions, first of all NSAID medication, and also other unusual diseases, may cause ulcers.
- Endoscopic differentiation of inflammatory lesions based solely on endoscopic images is not possible. Ulcers in the distal small bowel may be suggestive of Crohn's disease or tuberculosis, whereas diffuse lymphangiectasia and edema can be found in infections such as Whipple's disease and atypical mycobacteriosis, and also in idiopathic lymphangiectasia.
- A few small bowel erosions are occasionally seen in healthy volunteers.
- Stenosis can complicate Crohn's disease, radiation enteritis, eosinophilic enteritis, ischemia, and web formation in NSAID enteropathy.
- Ulcerative jejunoileitis is a potential complication of celiac disease. Biopsy is necessary to exclude lymphoma.
- Chronic small bowel ischemia can appear endoscopically as an ulcerated segment, sometimes leading to stenosis.

Scripted Voiceover

Time (min:sec)	*Voiceover text*
00:00	In the first patient, chromoendoscopy highlights villous atrophy and mosaic pattern in the duodenal bulb.
00:12	In the same patient, push enteroscopy additionally reveals multiple ulcers in a long jejunal segment. Endoscopic diagnosis of ulcerative jejuno-ileitis complicating celiac sprue was made and biopsies performed to rule out T-cell lymphoma. In this elderly patient presenting with malabsorption, celiac sprue had not been diagnosed before and was confirmed by antibody tests and biopsy.
00:55	The next capsule endoscopy shows another variant of ulcerative jejuno-Ileitis. This 71-year-old lady presented with malabsorption, diarrhea and weight loss. Celiac antibodies were inconclusive; histology demonstrated chronic idiopathic non-granulomatous ulcerative jejuno-ileitis. Edema, mosaic pattern and ulcers are visible. Villous atrophy is present as well, but has an irregular distribution, with areas showing either normal, enlarged or absent villi.
01:46	Whitish and swollen villi are the endoscopic sign of lymphangiectasia. Although often just a variant of normal, it may also accompany inflammatory or neoplastic diseases. In this case with clinical diagnosis of HIV enteropathy lymphangiectasia is the only endoscopic alteration. However, biopsy is necessary to rule out opportunistic infections.
02:19	This case shows a swollen mucosa and lymphangiectasia due to atypical mycobacteriosis caused by *Mycobacterium avium intracellulare*. The endoscopic similarity with Whipple's disease led to the term *Pseudo Whipple*. However, here the swelling of the mucosa in parts is more striking than lymphangiectasia with its whitish villi. This young patient had no HIV infection.
03:02	Cytomegalovirus (CMV) can occasionally affect the small bowel. This patient under immunosuppressive therapy for rheumatoid arthritis suffered from malabsorption.

Capsule endoscopy demonstrates jejunal ulcerations with the typical '*punched out*' appearance. There is hardly any inflammatory reaction surrounding the ulcers.

03:49 Radiation enteritis may occur even after several years. Fibrosis is a characteristic feature with thickened mucosa, sometimes causing stenosis. Focal lymphangiectasia with single or multiple white villi is seen, as well as erythema, erosions and focal villous atrophy. Neo-vascularization with red spots and angiectasias sometimes causes intestinal bleeding.

04:25 Mucosal breaks as erosions or ulcers in the small bowel due to intake of non-steroidal anti-inflammatory drugs (NSAID) are common. Red spots and petechiae are also frequently seen in NSAID enteropathy. Here, the unusual finding of patchy erythema and villous atrophy is seen. These lesions were completely reversible after cessation of NSAIDs.

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